WOW EMULSIONS

Creating the WOW factor to your formulations with our emulsifier package for multiple emulsions

oleon
a natural chemistry

HEALTH & BEAUTY

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MULTIPLE EMULSIONS

Castor oil

Palm

Maize

Rapeseed

Sunflower

Texture, touch and smell are some of the key sensories influencing consumer emotions and have a significant impact on the perceived quality of a cosmetic product. In search of premium sensory experiences, selecting the right emulsifier becomes incredibly important. It is the primary contributor to initial feel experience. Oleon has developed an innovative emulsifier package, Jolee 7777, that contains both water-in-oil and oil-in-water emulsifiers to form a multiple emulsion. A multiple emulsion is a so-called 'emulsion in an emulsion' where both oil-in-water and water-in-oil emulsions exist simultaneously. This combination enables a sensorial change during application: the initial O/W emulsion offers a light sensory followed by the nourishing finish known from W/O emulsions.

Jolee 7777 is an optimized emulsifier blend which enables the formulation of **W/O/W** (water-in-oil-in-water) emulsions in just one step through a **direct emulsification process.** Under the right preparation conditions and with an optimized water and oil phase, multiple emulsions with high stability can be obtained. On top of that Jolee 7777 is a liquid emulsifier package, meaning it can be used for cold process formulation methods, saving both time and energy.

Naturality profile

according to ISO 16128

NOI = 1

ECOCERT COSMOS APPROVED

NATRUE Approved

Jolee

Be honest
Be yourself
Be Jolee

Discover our Jolee® story

PRODUCT **FEATURES**

Jolee 7777

Function
Emulsifier blend for W/O/W emulsions

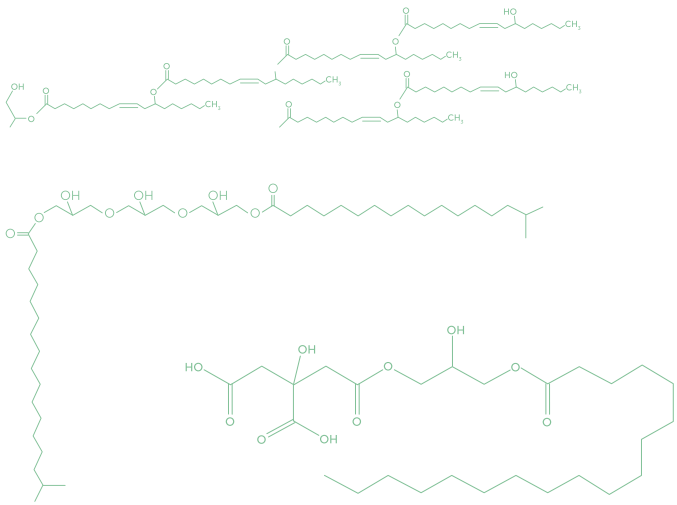
Features
Cold process emulsifier
1-step multiple emulsions

Usage level
4% - 8%

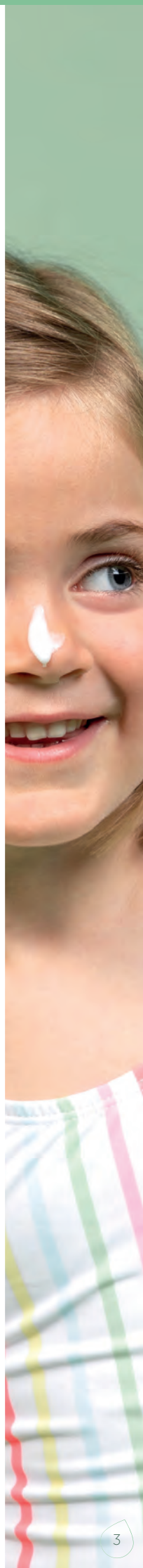
Application
sun skin

Origin

Biodegradability profile
Readily biodegredable (OECD 301B)



INCI Polyglyceryl-3 polyricinoleate, Glyceryl oleate citrate SE (and) Polyglyceryl-3 diisostearate



Physicochemical *properties*

Physical form	Yellowish liquid
Acid Value	4 - 10 mg KOH/g
Saponification value	180 - 205 mg KOH/g
Iodine value	60 - 80 g I_2/100g
Refractive index (20°C)	1.4786
Surface tension (20°C)	32 mN/m
CMC (20°C)	30 ppm
HLB	9

The building blocks of Jolee 7777 are highly saturated components, resulting in stable molecules. This way there is a low risk of oxidation, ensuring stability of odor and color.

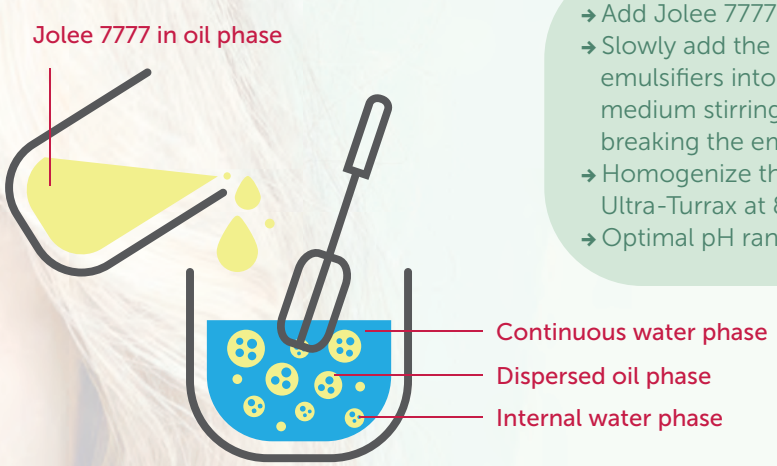
Solubility *properties*

SOLVENT : Jolee 7777	25 : 75	50 : 50	75 : 25
Sunflower oil	Soluble	Soluble	Soluble
Mineral oil	Soluble	Soluble	Soluble
Isopropyl myristate	Soluble	Soluble	Soluble
Dimethicone	Insoluble	Insoluble	Insoluble
C8/C10 triglycerides	Soluble	Soluble	Soluble

Table 1: Compatibility of Jolee 7777 with different solvents.

A MULTIPLE EMULSION IN ONE EMULSIFICATION STEP

The combination of both water-in-oil and oil-in-water emulsifiers, allows a W/O/W multiple emulsion to be formed by simply adding the oil phase, which contains the emulsifier package, to the water phase of your formulation.

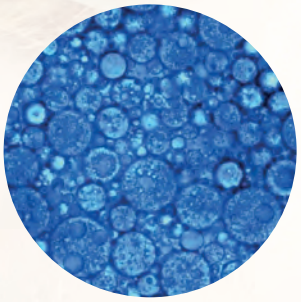


- Add Jolee 7777 to the oil phase.
- Slowly add the oil phase containing emulsifiers into the water phase under medium stirring (700 - 900 rpm) to avoid breaking the emulsion.
- Homogenize the final emulsion with Ultra-Turrax at 8000 rpm for 1 minute.
- Optimal pH range: 4 -10.

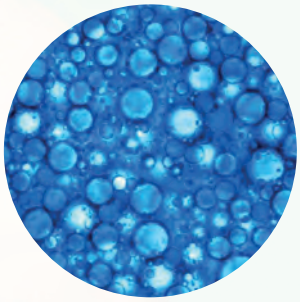
TIPS & TRICKS

- Oils: medium polar oil (e.g. triglycerides).
- Add thickener to stabilize the formulation (0.5 - 1.5%).
- Add electrolytes for optimal osmotic balance.
- Ultra Turrax stirring: medium during oil addition (700 - 900 rpm until dispersed) and high after emulsion is formed (8000 rpm - 1 min).

Let's have a closer look...



W/O/W emulsion



O/W emulsion

Figure 1 & 2: 100x magnification microscopic image of W/O/W emulsion (left) and O/W emulsion (right).

APPLICATION BENEFITS

SKIN

When an emulsion made with Jolee 7777 is spread onto the skin, a clear transition is observed: the first impression is the external O/W emulsion, spreading nicely with a watery fresh feel. Near the end of the spreading, the second impression is the internal W/O emulsion; forming a nourishing film on the skin. As Jolee 7777 consists of non-oily components, it is ideal for the development of lighter formulations like liquid sprays.

*Formulation **Hydrating cream***

	INGREDIENT	INCI	% W/W
PHASE A	Water	Aqua	Up to 100
	Glycerine 4811	Glycerin	2
	Fucocert	Biosaccharid gum	2
	Carbopol Ultrez	Carbomer	0.6
PHASE B	**Jolee 7777**	Polyglyceryl-3 polyricinoleate (and) Glyceryl oleate citrate SE (and) Polyglyceryl-3 diisostearate	4
	Radia 7104	Caprylic/capric triglycerides	3
	Jolee 7202	Propylene glycol diheptanoate	2
	Jolee 7750	Isoamyl laurate	2
PHASE C	Cellulobeads	Cellulose	0.5
	Menthol	Menthol	0.6
	NaOH (pH 5-5,5)	NaOH	Q.S
	Preservative	Phenoxyethanol	0.7
	Perfume		0.8

Manufacturing procedure

1. Weigh all the ingredients of phase A in a beaker and mix to a homogeneous solution.
2. Weigh all the ingredients of phase B in a beaker and blend until a homogeneous mixture is obtained.
3. Slowly add phase B into phase A. Do this under medium stirring (800 rpm) to avoid breakage of the emulsion.
4. Add phase C and adjust pH until 5-5.5.
5. Homogenize the emulsion with an Ultra Turrax at >8000 rpm during 1 minute.

Properties

Appearance: soft, white cream / pH: 5 / Viscosity: 65200 cP (spindle 06, 10 rpm, 1 min)

SUN

Suncare products are expected to remain on the skin even after water exposure or perspiration. Creating a W/O/W emulsion with Jolee 7777 will improve film forming properties and water resistance of your formulation compared to a regular O/W emulsion.

The film forming properties and water resistance of an O/W emulsion containing 3% of glyceryl stearate citrate SE and a W/O/W emulsion containing 3% Jolee 7777 were compared. It is safe to say Jolee 7777 shows an added value for sun screen formulations in terms of water resistant properties in comparison to a conventional O/W formulation.

Film forming

Figure 3: *Film forming properties of an O/W emulsion (red) and a W/O/W emulsion containing Jolee 7777 (green) expressed as % water that is evaporated. The evaluation was based on an in-house method where a cup of water was covered with craft paper covered by the sun care formulation and put in a 40°C oven for 48h.*

Water resistance

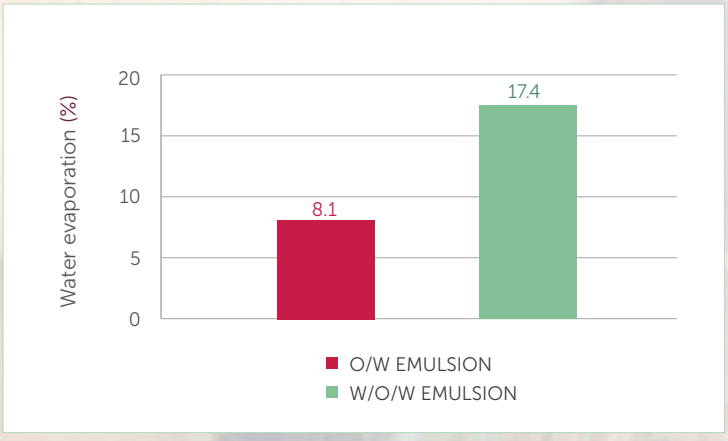


Figure 4: *Water resistance of an O/W emulsion (red) and a W/O/W emulsion containing Jolee 7777 (green) expressed as % of remaining formulation. A cotton tissue with the sun care formulation was stirred into water for 30 minutes. The evaluation was based on the weight difference after drying the cotton at 80°C overnight.*

Sustainability at Oleon is not only about our Natural Chemistry, it is also reflected in our daily choices. For the printing of this brochure, we opted for uncoated and naturally white (unbleached) paper made from 100% recycled fibers.

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